What is Claimed is:

1. A connection oriented mode communication system for use in a communication system composed of a plurality of node apparatus, comprising:

alternative connection setting means for setting a communication connection as an alternative connection substitutive for a currently working communication connection (hereinafter referred to as original connection) so that the alternative connection connects the source node apparatus and the destination node apparatus of the original connection to each other by way of a route physically different from that of the original connection; and

switching control means for controlling switching between the original connection and the alternative connection.

2. A connection oriented mode communication system according to claim 1, further comprising a connection test unit for testing normality of the alternative connection.

3. A connection oriented mode communication system according to claim 2, wherein the switching control means is arranged not to carry out switching from the original connection to the alternative connection until

the connection test unit confirms the normality of the alternative connection.

4. A connection oriented mode communication system according to claim 3, further comprising a network management unit which issues a command of switching from the original connection to the alternative connection to the switching control means when the network management unit receives a notice of normality confirmation of the alternative connection from the connection test unit.

5. A node apparatus for use in a connection oriented mode communication system, comprising:

an alternative connection setting processing unit for setting a communication connection as an alternative connection substitutive for a currently working communication connection (hereinafter referred to as original connection) so that the alternative connection connects the source node apparatus and the destination node apparatus of the original connection to each other by way of a route physically different from that of the original connection, and

a switching control unit for controlling switching between the original connection and the alternative connection.

6. A node apparatus for use in a connection

oriented mode communication system according to claim 5, further comprising a cell copy unit for copying transmission cell data which is attached with identification information of the original connection and of which destination is a receiving side node apparatus, wherein

the alternative connection setting processing unit includes an identification information setting processing unit for carrying out processing for setting identification information of the alternative connection to copy cell data created by the cell copy unit.

7. A node apparatus for use in a connection oriented mode communication system according to claim 6, wherein the connection switching control unit includes a cell copy control unit which carries out switching from the original connection to the alternative connection in such a manner that original transmission cell data, which is attached with identification information of the original connection and of which destination is a receiving side node apparatus, is made invalid while the copy cell data created by the cell copy unit is made valid as transmission cell data of which destination is a receiving side node apparatus.

8. A node apparatus for use in a connection

oriented mode communication system according to claim 7, wherein the cell copy control unit is arranged such that the cell copy unit is halted from cell copy operation and the original transmission cell data is made valid, whereby switching from the alternative connection to the original connection is accomplished.

9. A node apparatus for use in a connection oriented mode communication system according to claim 6, wherein the alternative connection setting processing unit includes an identification information conversion setting processing unit for carrying out identification information conversion setting processing which makes it possible for the node apparatus to receive the copy cell data transmitted from the transmission side node apparatus as the original cell data transmitted from the transmission side node apparatus.

10. A node apparatus for use in a connection oriented mode communication system according to claim 9, wherein the connection switching control unit includes a cell selection control unit which carries out switching from the original connection to the alternative connection by control of selecting the copy cell data while carries out switching from the alternative connection to the original connection by control of selecting the original cell data.

11. A node apparatus for use in a connection oriented mode communication system according to claim 5, having connected thereto a connection test unit for testing the normality of the alternative connection, wherein

the alternative connection setting processing unit includes a test connection setting processing unit which carries out setting processing of test communication connection which leads the alternative connection to the connection test unit.

12. A node apparatus for use in a connection oriented mode communication system according to claim 11, wherein the connection switching control unit includes a test switching unit which carries out switching from the original connection to the alternative connection when the connection test unit confirms the normality of the alternative connection.

13. A node apparatus for use in a connection oriented mode communication system according to claim 12, wherein

the connection test unit includes a layer normality confirming means for confirming the normality of each of a physical layer, an adaptation layer and an ATM layer of the alternative connection, and

the test switching unit is arranged to carry out

switching from the original connection to the alternative connection when the layer normality confirming means confirms the normality of all layers.

14. A node apparatus for use in a connection oriented mode communication system according to claim 13, wherein the layer normality confirming means is arranged to confirm coordination of the alternative connection.

15. A method of setting connection comprising:

an alternative connection setting step for setting a communication connection as an alternative connection substitutive for a currently working communication connection (hereinafter referred to as original connection) so that the alternative connection connects the source node apparatus and the destination node apparatus of the original connection to each other by way of a route physically different from that of the original connection; and

a connection switching step for switching between the original connection and the alternative connection.

16. A method of setting connection according to claim 15, further comprising:

a connection test step for testing the normality of the alternative connection by establishing a

communication connection to the alternative connection, wherein

the connection switching step is arranged to execute switching from the original connection to the alternative connection when the normality of the alternative connection is confirmed at the connection test step.

17. A method of setting connection according to claim 16, wherein

the connection test step includes a layer normality confirming step for confirming the normality of each of a physical layer, an adaptation layer and an ATM layer of the alternative connection, and

the connection switching step is arranged not to switch from the original connection to the alternative connection until the normality is confirmed for all layers at the layer normality confirming step.

18. A method of setting connection according to claim 17, wherein

the layer normality confirming step includes a step for confirming coordination of the alternative connection.

19. A method of setting connection according to claim 16, wherein

the connection switching step includes a step for releasing the setting of the original connection after the original connection and the alternative connection are brought to a state in which an identical user cell can be transmitted through the original connection and the alternative connection.

20. A method of setting connection according to claim 17, wherein

the connection switching step includes a step for releasing the setting of the original connection after the original connection and the alternative connection are brought to a state in which an identical user cell can be transmitted through the original connection and the alternative connection.

21. A method of setting connection according to claim 18, wherein

the connection switching step is arranged to include a step for releasing the setting of the original connection after the original connection and the alternative connection are brought to a state in which an identical user cell can be transmitted through the original connection and the alternative connection.

22. A method of setting connection comprising:

a connection setting step for establishing a first

communication connection between a source node apparatus and a destination node apparatus; and

an alternative connection setting step for establishing a second communication connection as an alternative connection substitutive for the first communication connection so that the second connection connects the source node apparatus and the destination node apparatus of the first communication connection to each other by way of a route physically different from that of the first communication connection.